



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/664,232	09/17/2003	Mark S. Knighton	4956P002D	3365
8791	7590	07/23/2004	EXAMINER	
BLAKELY SOKOLOFF TAYLOR & ZAFMAN 12400 WILSHIRE BOULEVARD, SEVENTH FLOOR LOS ANGELES, CA 90025			BARTH, VINCENT P	
			ART UNIT	PAPER NUMBER
			2877	

DATE MAILED: 07/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/664,232	KNIGHTON ET AL.	
	Examiner	Art Unit	
	Vincent P. Barth	2877	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 June 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,5,6,8-10,15 and 16 is/are rejected.
- 7) ☒ Claim(s) 3,4,7,11-14,17,18 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input checked="" type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. <u>0704</u> . |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____. | 6) <input type="checkbox"/> Other: _____. |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 2 and 5 are rejected under 35 U.S.C. §102(b) as being anticipated by Chlestil, U.S. Pat. No. 4,302,097 (24 Nov. 2004).

3. Referring to Claims 1, 2 and 5, Chlestil discloses creating a three-dimensional representation of an object H (for example, a human head) by a first silhouette method, in which two mirrors 2 and 3 direct silhouettes from two screens 4 and 5 into an imaging camera 1 (Fig. 1). Chlestil discloses creating a three-dimensional representation of an object H by a second contour line projection method, in which light projectors 10, 13 and 21 impinge on the object H, and are imaged by cameras 2 and 3 (Fig. 1). Chlestil discloses that each method is for the recording of shape related data (col. 3, ln. 44), which is used to form a solid representation in sculpting material (col. 1, lns. 54-56), thus the first and second methods of image capturing each derive 3D data, and the system is designed to either use the two methods separately, or combine them (col. 1, ln. 45 to col. 2, ln. 64). Chlestil discloses that the object H is moved relative to the imaging devices around an axis of rotation O (Fig. 1).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 6, 8-10, 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chlestil, U.S. Pat. No. 4,302,097 (24 Nov. 2004).

6. Referring to Claims 6 and 10, Chlestil does not explicitly identify either the contour line method as active ranging, or the silhouette method as passive imaging. However, those of ordinary skill in the art generally consider contour line 3D mapping as an active approach, in that structured lines impinge on the subject, and the silhouette method as a passive approach, since the camera merely images a view of subject which blocks the lighting source.

7. Referring to Claims 8 and 9, Chlestil discloses creating a three-dimensional representation of an object H (for example, a human head) by a first silhouette method, in which two mirrors 2 and 3 direct silhouettes from two screens 4 and 5 into an imaging camera 1 (Fig. 1). Chlestil discloses creating a three-dimensional representation of an object H by a second contour line projection method, in which light projectors 10, 13 and 21 impinge on the object H, and are imaged by cameras 2 and 3 (Fig. 1). Chlestil discloses that each method is for the recording of shape related data (col. 3, ln. 44), which is used to form a solid representation in sculpting material (col. 1, lns. 54-56), thus the first and second methods of image capturing each derive 3D data, and the system is designed to either use the two methods separately, or combine

Art Unit: 2877

them (col. 1, ln. 45 to col. 2, ln. 64). Chlestil discloses that the object H is moved relative to the imaging devices around an axis of rotation O (Fig. 1). Chlestil does not explicitly use the term “digitizer” with respect to the system, nor is a processor explicitly shown to combine the data. However, Chlestil explicitly discloses that the image data may be recorded by electronic means, or imaged with a television camera (col. 2, lns. 15-19; col. 2, ln. 38). Therefore, those of skill in the art reading the Chlestil disclosure presently would interpret the reference as suggesting a digital system, including modern processors, since computer processors were available at the time of invention and used in video processing.

8. Referring to Claims 15 and 16, Chlestil discloses all of the limitations claimed, but does not explicitly disclose that a plurality of lens and aperture combinations is used, or that such lenses are contained in a lens barrel. Chlestil discloses cameras 1, 8, and 16 both generically and as television cameras, thus leaving latitude to those practicing the invention to use alternative embodiments understood by those in the art to be within the scope of the disclosure. Cameras, including television cameras, have been well known to those of ordinary skill in the art to be fitted with image sensor arrays and a plurality of lenses and apertures, such that those imaging a subject may have a choice to optimize the image quality by selecting a suitable lens/aperture combination. See MPEP §2144.03. Moreover, since Chlestil discloses cameras, implicit in such disclosure is that the cameras have at least a lens with a barrel to contain such lens. See MPEP §2144.01.

Allowable Subject Matter

9. Claims 3, 4, 7, 11-14, 17 and 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, since the prior art references, either considered alone or in combination, do not disclose or render obvious the limitations set forth therein.

10. Referring to Claim 3, the prior art references, either considered alone or in combination, do not disclose or render obvious the limitations whereby capturing with the capturing device an intensity gradient based 3D representation, in combination with the remaining limitations in the claim. Referring to Claim 4, the prior art references, either considered alone or in combination, do not disclose or render obvious the limitations whereby capturing comprises the use of a linear sensor array, in combination with the remaining limitations in the claim. Referring to Claim 7, the prior art references, either considered alone or in combination, do not disclose or render obvious the limitations whereby the first capture method is intensity gradient ranging and the second capture method is stereoscopy, in combination with the remaining limitations in the claim. Referring to Claim 11, the prior art references, either considered alone or in combination, do not disclose or render obvious the limitations whereby the first capture method is intensity gradient ranging and the second capture method is stereoscopy, in combination with the remaining limitations in the claim. Referring to Claim 12, the prior art references, either considered alone or in combination, do not disclose or render obvious the limitations whereby a gravitational orientation unit is responsive to gravity, in combination with the remaining limitations in the claim. Referring to Claim 13, the prior art references, either considered alone or in combination, do not disclose or render obvious the limitations whereby a gravitational

Art Unit: 2877

orientation unit responsive to the relative orientation of gravity comprises a pendulum having a reflective element mounted thereon, in combination with the remaining limitations in the claim.

Claim 14 is allowable based on its dependency upon the claim from which it is dependent.

Referring to Claim 17, the prior art references, either considered alone or in combination, do not disclose or render obvious the limitations whereby the digitizer comprises a spring to bias the shaft relative to the housing, in combination with the remaining limitations in the claim. Claim 18 is allowable based on its dependency upon the claim from which it is dependent.

Comments

11. A Telephone Interview was conducted on 13 July 2004 (Interview Summary mailed herewith), in which Attorney Coester provided arguments to Examiner Barth to supplement those found in the Amendment dated 14 June 2004 concerning the Sinclair reference (see especially, Remarks pg. 7, 2d full para.). Attorney Coester pointed out that in the context of the instant Application, a “method” of capturing a 3D image would be, for example, either stereoscopy or a gradient based system. Thus, with respect to Claim 8 as an example, Attorney Coester argued that the Sinclair reference disclosed only one “method” (stereoscopy), with the RGB camera in the Sinclair reference serving only to provide additional texture information, rather than 3D information. The Examiner has reviewed the portion of the instant Specification entitled Background, and finds support for the arguments presented by Counsel for Applicants. In particular, the instant Specification sets forth four categories of 3D imaging previously known in the art, and one new category, that being the gradient based system for which a patent has now been granted as Knighton, et al., U.S. Pat. No. 6,639,684, each category corresponding to a

Art Unit: 2877

“method” as the term is used in the instant claims. The Examiner finds that such usage of the term “method” in the instant claims is supported by the Specification, and would be clear to those of skill in the art. Accordingly, the Sinclair reference is withdrawn, including any rejections based on the Sinclair reference. In this connection, and in view of the claim construction now adopted by the Examiner, new references have been provided to form the basis of rejection of some of the claims. The instant Office Action has therefore been made non-final, to permits Applicants an opportunity to respond to these new references and rejections. The Examiner appreciates the diligent efforts of Counsel for Applicants in clarifying matters.

12. Applicants have argued that the term “active ranging” in Claims 6 and 10 does not necessarily require the use of the term in the Specification, since those in the art would understand the term in its general plain meaning. The Examiner finds such argument satisfactory, and thus the rejections of Claims 6 and 10 pursuant to §112 for lacking an antecedent basis are withdrawn. Applicants have appropriately amended Claim 17 to provide structural cooperative relationships between the elements, thus the rejections of Claims 17 and 18 pursuant to §112 are withdrawn.

Art Unit: 2877

13. The following prior art references are of interest: Kerner, U.S. Pat. No. 6,567,156 (20 May 2003), discloses a system for 3D measurement of objects (gemstones coated to permit measurement) using both a silhouette method and a triangulation method. The Examiner notes that the filing date of the Kerner reference is only separated from the instant Application by twelve days. Svetkoff, et al., U.S. Pat. No. 6,366,357 (2 Apr. 2002), discloses a system for 3D measurement of small objects using both a confocal method and a triangulation based method. Geng, U.S. Pat. No. 6,028,672 (22 Feb. 2000), discloses a system for 3D measurement of objects using both a stereoscopic method and a triangulation method.

CONCLUSION

14. Applicants' Claims 1, 2, 5, 6, 8-10, 15 and 16 are rejected based on the reasons set forth above.

15. Applicants' Claims 3, 4, 7, 11-14, 17 and 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

16. Any inquiries concerning this communication from the Examiner should be directed to Vincent P. Barth, whose telephone number is 571-272-2410, and who may be ordinarily reached from 9:00 a.m. to 5:30 p.m., Monday through Friday. The fax number for the group before final actions is 703-872-9306.

17. If attempts to reach the Examiner prove unsuccessful, the Examiner's supervisor is Frank G. Font, who may be reached at 571-272-2415.

18. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Richard A. Rosenberger
Primary Examiner